The focus on this theme distinguishes this collection from other recent edited volumes, some of which overlap both in the content and also with the authors represented in this book. For example, *Pediatric Neuropsychology, Second Edition: Research, Theory, and Practice* (Yeates, Ris, Taylor, & Pennington, 2009) reviews many medical disorders of childhood but does not emphasize this lifespan perspective. A recent textbook that does share a lifespan focus, *Principles and Practice of Lifespan Developmental Neuropsychology* (Donders & Hunter, 2010), overlaps with much of the content in this book; however, Baron and Rey-Casserly focus more narrowly on conditions for which there have been recent advances in diagnosis and treatment, and provide broader reflections on the implications of these advances.

Because the content of this book is fairly selective, it will not replace introductory textbooks, and does not cover the breadth of conditions treated by pediatric practitioners. For example, there is no specific chapter on epilepsy, and common developmental disorders such as attention deficit/hyperactivity disorder or learning disabilities are not included as there have been fewer recent changes to diagnosis and treatments. However, because of its focused theme, Baron and Rey-Casserly’s book provides a unique approach to examining trends in pediatric neuropsychology and their implications for neuropsychology as a whole. For any professionals who work with children with complex medical conditions, or who wish to understand the influence of these conditions upon the lifelong development of these individuals, this book will be a valuable resource.

References


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The title of this book is puzzling at first, seeming to refer to redundant topics, but it takes an important place in the corpus by covering multiple bases. It covers the biological bases of cancer, which in some chapters helps the interested scientist or practitioner to develop greater insight into the pathophysiology that their work should be based on, and also covers the neuropsychological phenomena associated with the ontogeny of cancer, and the effects of cancer treatments. This is accomplished by the inclusion of a large proportion of specialists in medicine as well as neuropsychology. The book’s inclusion of the biological bases makes it a valuable text to have as reference, but its weakness is also in the inconsistency in addressing these problems. This book provides a primer for neuropsychologists in oncology to have a basic understanding of the histologies of cancers and treatment armamentaria, though this knowledge base is constantly changing. The mechanisms of chemotherapy-induced changes in cognition are discussed in all the medical chapters in regard to the chemotherapies that are specific to each disease. It is critical for successful neuropsychological research and practice with cancer patients to understand how cancer, collateral clinical factors, and treatments together cause cognitive deficits. For example, an important hypothesis recurs among chapters on different cancers about the risk of cognitive injury from platinum-based chemotherapy, with apparent reversal of injury symptoms when treatment ends. The chapters do not provide the answers, but pose some of the problems of investigating chemotherapy effects on cognition.
Section 1 is on the biological components, methods of medical care, and lessons learned by practitioners. The cancers included are urologic, breast, gynecologic, colorectal, head and neck, lung, skin, hematologic, and brain cancers. Pediatric cancers are briefly treated.

Breast cancer is a very important area of inclusion because of its large representation in the U.S. population (~22.6% of women will be diagnosed in their lifetime, and it is 14% of all cancers (National Cancer Institute, Surveillance, Epidemiology, and End Results (SEER) Program current statistics)). Unfortunately, the state of the science needed to understand why breast cancer patients complain of cognitive changes remains unclear, and the chapter does not provide a causal hypothesis. For example, we learn that the cognitive complaints of these patients correspond with depression, but not with objective neurological deficits. We also learn of a study in which 35% of breast cancer patients had cognitive impairment prior to any treatment. Very helpfully, the author, Dr. Elizabeth Peralta, recommends better assessment methods for research purposes, and that researchers not rely only on “written tests and interviews.” She also recommends that investigations use operant conditioning methods of assessment, and that study design create a translational bridge between animal and human studies of cognition, as better starting points at this time. The reader of this chapter can be grateful to Dr. Peralta for her critical discussion on new directions for neuropsychological studies.

The focus on CNS cancers is spread among three chapters, and its comprehensiveness is at the cost of some repetitiveness and a limited overview of the many issues that interact in neuro-oncology. Although chemotherapy and radiotherapy are the prime suspects of causation of cognitive injury, they are not the sole cause, as shown in this book, such as pro-inflammatory cytokine proliferation caused by cancer, and paraneoplastic diseases in response to cancer ontogeny and oncogenesis. Studies of the multiple factors affecting neuropsychological findings, including the tumor itself, in children with brain tumors, especially prior to any treatments, are absent (e.g., Iuvone et al., 2011; Stargatt, Rosenfeld, Maixner, & Ashley, 2007; Varela, Liakopoulou, Alexiou, Pitsouni, & Alevizopoulos, 2011).

This book points out an underlying problem in unraveling the causes of cognitive impairments in CNS cancers, which is that most studies in brain cancer do not include pretreatment evaluations. If one focuses only on those studies with pretreatment baselines and prospectively planned longitudinal designs, even those with subjects-as-their-own-controllers, the evidence is limited for many of the assumptions about simple treatment causation of cognitive damage. A problem not noted in this book, but which is related to the negative results for some cognitive studies of treatment effects, is that the tests used are not equivalently sensitive, permitting false allegations about disease effects on cognition. There are significant differences among tests in the degree of noise contributed by some commonly used neuropsychological tests.

Chapter 6 on head and neck cancers provides an interesting discussion of the interactions of factors that lead to the emergence of cancer, and that are secondary causes of cognitive impairment. Chapter 7 on lung cancer is different because it is the only medical chapter written by non-medical faculty, though more information on cognitive outcomes and inferences would be helpful. The hematologic chapter addresses neurologic comorbidities of leukemia. Chapter 10 on Cancers of Childhood describes many of the most common childhood cancers, and is focused mainly on non-CNS cancers. Chapter 11 on brain metastases and tumors is generally comprehensive and provides critical neurological information that demonstrates the complexity of the diagnostic and treatment demands of this field. This chapter is helpful in directing future researchers to important questions and dilemmas facing patients. Absent is discussion of common neuropsychological problems such as how psychiatric symptoms including depression and anxiety can be caused by the locus of tumor, the effects of surgery on cognition and mood, and the difficulty associating specific structures with functions in neurofibromatosis.

The role of neuroimaging (Chapter 12) is so critical in the history and future of cancer treatment, that this well written chapter is a great asset of the book. The authors address in sufficient detail the issues in using neuroimaging to differentiate tumor from other abnormal tissue boundaries (such as edema, post-surgical changes or radiation injury), grading of tumors, guidance of treatments, treatment effects, and language mapping during neurosurgery. The ongoing controversies of brain injury from chemotherapy, radiotherapy, or disease are discussed with clinical detail from the perspective of the neuroimaging of the developing brain. The benefits of different imaging techniques are thoughtfully discussed.

Section 2 is on the neuropsychological impact of many cancers. Chapter 18 is a particularly good conceptualization and long view of the problems of psychosocial functioning after cancer, and focuses on three critical diseases: breast cancer, lung cancer, and neuro-oncologic disease, though it is not limited to these. It is helpful in directing future researchers to important questions and dilemmas facing patients. A discussion of depression and anxiety as they relate to neurological versus psychogenic causes is needed. Age-specific issues are covered, and it provides a model of psychosocial treatment. Chapter 19 on Childhood cancers has large areas of overlap with Chapters 10 and 11, and with the chapter on neuroimaging. It focuses on the cognitive components common to all or mixed groups of pediatric cancers. The authors provide a critical review of efforts to develop an effective model of cognitive remediation for cancer and treatment related cognitive impairment, and identify several issues that should be considered in future efforts to improve cognition in these children who have distinct disadvantages for maturing into independent adults. Critical comparisons are made of disease versus treatment effects. This chapter meets a critical need in
the book to review the neuropsychological effects (except emotion) of cerebellar tumors, and of radiotherapy to the hippocampus. Finally, it includes the research on remediating cognitive injury through rehabilitation.

The chapters on attention and executive functions (Chapter 13), memory (Chapter 14), language (Chapter 15), visuospatial and visuoperceptual functioning (Chapter 16), and sensory-motor function (Chapter 17) review the cognitive neuroscience of cognition, the ways that cognition is damaged in oncology, the treatment efforts to preserve cognition, and make treatment recommendations. These chapters are exceptionally helpful in directing the practicing neuropsychologist to structure assessment from a cognitive system point of view, which is a practical and heuristic way to diagnose the cognitive problems resulting from cancer and especially brain tumors, and to thereby create the most relevant recommendations for management and rehabilitation.

Section 3 is on questions regarding interventions such as rehabilitation, pharmacologic treatments of complications, and other aspects that require support in order to reach the best possible quality of life in the context of cancer. This section focuses on complex cognitive systems that are often compromised, and the authors attempt to differentiate the influences while recognizing that the unpredictable boundaries of tumors require a cognitive systems viewpoint to understand damage.

The chapter on Rehabilitation (Chapter 20) critically reviews general rehabilitation approaches and specific techniques for various cognitive problems in adults and children, and is one of the most pragmatically helpful chapters. In addition, Chapter 21 about pharmacologic interventions, written by oncologists, clearly makes recommendations based on empirically-based benefits and limitations for medication to support common cancer side effects of fatigue, cognitive impairment, depression, anxiety, and sexual dysfunction. The problems inherent in objective evaluation of rehabilitation methods, such as the strong effects of incentives to improve on measures that are dependent on subjective judgment of efficacy, failure to address “what are we treating?,” and lack of follow-up measurements of effects, continue to plague the field. Chapter 22 addresses the important problems of cancer-related fatigue and the role of exercise, nutrition, and psychological well-being on fatigue. The importance of meditation techniques for cancer patients is not discussed in Section 3.

The book beautifully ends with a particularly good chapter on quality of life by Rhonda and Gary Johnson that addresses many of the important experiences of the cancer patient from childhood into adulthood, and how to best manage them. It is the only chapter to address pain, though too briefly.

Conclusions

Readers may be surprised at how high the risk of CNS response is related to both disease and treatments. This book, in both its direct and indirect inferences, points to the need for disease-specific neurocognitive methods in broadly occurring CNS and non-CNS cancers. Other fields, such as cardiology, HIV, dementia, and epilepsy, have made greater gains in working towards neuropsychological tests that are associated with biomarkers for the disease or the brain regions affected by the disease. Psychological and neuropsychological publications in oncology have not reached this level of development, and this book at least points to the need to do so. All in all, this is a beautifully conceptualized book that should be on the bookshelves of many specialists who work in the very challenging field of Oncology.

References


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